

REMARKS

In paragraph 1 of the Office Action claims 11 and 28 are objected to, indicating that "said nonmagnetic" should be changed to --a nonmagnetic--. Responsive thereto, Applicant has amended the dependency of claims 11 and 28 to provide appropriate antecedent basis for "said nonmagnetic". Applicant therefore respectfully submits that this ground of objection has been satisfied.

In paragraphs 2 and 3 of the Office Action claims 1-3, 6, 10-14, 18-20, 23, 27-32 are rejected under 35 U.S.C. 102(e) as being anticipated by Carey et al (US Pat 6266218), stating:

"Carey et al shows a spin valve MR head in figure 10 that has: a free magnetic layer 78; two anti-parallel coupled magnetic layers 84/96 on the end regions of free layer 78; nonmagnetic Ru layer 98; seed layer 88 with a first one 84 of the two magnetic layers disposed on top of the seed layer 88; the net biasing magnetic field is in the same direction as the free layer magnetization; as per claims 11 and 12, Carey et al sets forth in col. 4, lines 15-21 that when CoPtCr is used, then a third and fourth magnetic layer (e.g. Co, with CoFe as an inherent variant of Co based alloys) is used as a sub-layer to the anti-parallel magnetic layers."

Responsive thereto, Applicant has amended independent claims 1, 13, 18 and 30 to provide further limitations that distinguish the present invention from the teachings of Carey. Applicant therefore respectfully submits that these independent claims are no longer anticipated by Carey. Applicant has further amended dependent claims 3, 20 and 31 to conform with the changes to their respective independent claims, and to further distinguish the teachings of Carey. The differences between the teachings of Carey and the amended claims is next discussed.

With regard to the present invention, as is best seen in Figs. 3 and 4, Applicant's free magnetic layer 68 is a planar layer having a central region and two end regions 92. The free magnetic layer 68 has a planar upper surface 146 (see Fig. 4) upon which an antiparallel coupled magnetic layer structure 120 is fabricated in the end region 92. Note: Applicant has herewith corrected Figs. 4 and 6 to change the number "96" to --92--, which identifies the end regions as shown in Figs. 3 and 5). As will be understood from reading Applicant's specification, Applicant's invention involves the fabrication of the antiparallel coupled magnetic structure upon the planar upper surface of the end regions of the free magnetic layer to provide effective biasing to the central portions of the free magnetic layer and minimize noise from the end regions of the free magnetic layer.

With regard to the teachings of Carey '218, with particular reference to Fig. 10 cited in the rejection, a free layer 78 is shown. Significantly, a layer 88 is fabricated on top of the top surface of the free layer 78. Carey, in Fig. 10, probably has a typographical error in identifying this layer with the number 88, although the error is not significant in this argument. The error can be seen by reference to Fig. 9 in which the layer on top of the free layer 78 is designated by the number 82 and identified in column 7, line 15 as a nonmagnetic cap layer. Conversely, if this layer above the free layer 78 is accurately identified in Fig. 10 as numeral 88 then this layer is a nonmagnetic exchange coupling layer, first identified in column 7, line 25. Such exchange coupled layers 88 are typically disposed between antiparallel coupled magnetic layers, such as 84 and 86, as depicted in Figs. 9 and 10.

Regardless of whether the layer on top of the free magnetic layer 78 of Carey is a cap layer or a exchange coupling layer, it is clear from Carey that this layer is composed of a non-magnetic material.

Turning now to Applicant's independent claims 1, 18 and 30, a significant distinguishing limitation in these claims from the teachings of Carey is that Applicant's antiparallel coupled magnetic layer structure is fabricated directly upon the upper surface of the end portions of the free magnetic layer. There is no intervening layer, whether a cap layer or a exchange coupling layer that is interposed between the upper surface of the end portions of the free magnetic layer and the antiparallel coupled magnetic layer structure, as is taught in Carey. Applicant therefore respectfully submits that amended independent claims 1, 18 and 30 recite subject matter that is not anticipated by the teachings of Carey.

With regard to amended independent claim 13 and amended dependent claims 3, 20 and 31, each said claim further includes the limitation of a magnetic seed layer that is disposed directly upon the upper surface of the end portions of the free magnetic layer. Carey teaches a non-magnetic layer, whether it is a cap layer 82 or a non-magnetic exchange coupling layer 88, as discussed above with regard to Fig. 10. Thus claims 13, 2, 20 and 31 recite limitations not taught by Carey.

With regard to the remaining rejected dependent claims, Applicant asserts that these claims are allowable in that they depend, either directly or indirectly, from an allowable base claim.

In paragraphs 4 and 5 of the Office Action claims 4, 15, 21 are rejected under 35 U.S.C. 103(a) as being obvious over Carey et al in view Aoshima et al (US Pat 6477020), stating:

"Carey shows an MR head with anti-parallel biasing layers as noted above. However, Carey et al does not disclose that the seed layer has a BCC crystal structure. Aoshima et al shows an MR head wherein it is disclosed at col. 1, lines 29-35 BCC crystal structure seed layers improve the biasing characteristics. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a BCC crystal material for the seed layer in Carey et al as doing this would improve the biasing of the free layer as taught by Aoshima et al.

It is noted that the applied reference appears to have a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by:

(1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(l)(1) and § 706.02(l)(2)."

Responsive thereto, Applicant respectfully traverses this ground of rejection and asserts that dependent claims 4, 15 and 21 recite patentable subject matter.

Initially, Applicant does not see where Carey discloses the use of a seed layer in fabricating antiparallel coupled structures. Thus the combination of Carey's teachings with those of Aoshima regarding seed layers is not apparent. Additionally, Applicant notes in Aoshima '020, column 1, line 64-column 2, line 9, it is not always the case that a BCC seed layer will improve the biasing characteristics of a layer formed thereabove.

Additionally, Applicant asserts, as set forth herebelow, that there was common ownership of the cited Carey et al reference 6,266,218 and the invention described in the instant application, at the time the invention described in the instant application was made. Applicant therefore

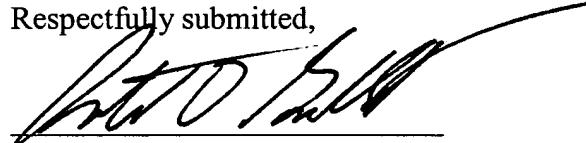
respectfully submits that this rejection is also overcome by the fact of common ownership. A statement of common ownership is submitted herewith.

In paragraph 6 of the Office Action claims 5, 7-9, 16, 17, 22, 24-26, and 32-35 are objected to as being dependent upon a rejected claim but allowable if rewritten in independent form. Responsive thereto, Applicant appreciates the indication of allowable subject matter. However, in that Applicant has amended the independent claims in the present application to be allowable, Applicant respectfully declines to amend these claims.

In paragraph 7 of the Office Action further prior art is made of record. Applicant has reviewed the prior art and believes that the teachings thereof are at most cumulative to the applied art.

Having responded to all of the paragraphs of the Office Action, and having amended the claims accordingly, Applicant respectfully submits that the Application is now in condition for allowance. Applicant therefore respectfully requests that a Notice of Allowance be forthcoming at the Examiner's earliest opportunity. Should the Examiner have any questions or comments with regard to this amendment, a telephonic conference at the number set forth below is respectfully requested.

Respectfully submitted,



ROBERT O. GUILLOT

Reg. No. 28,852

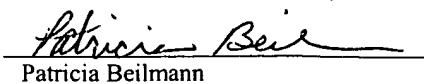
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IPLO®
Intellectual Property Law Offices
1901 S. Bascom Avenue, Suite 660
Campbell, CA 95008
Telephone: (408) 558-9950
Facsimile: (408) 558-9960

CERTIFICATE OF MAILING (37 CFR 1.8(a))

I hereby certify that this paper (along with any referred to as being attached or enclosed) is being deposited on October 1, 2003 with the U.S. Postal Service as first class mail in an envelope addressed to: MS Non Fee Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Date: October 1, 2003



Patricia Beilmann

